
Achieving Operational Excellence through IT and Automation Solutions

Digital Manufacturing Vision

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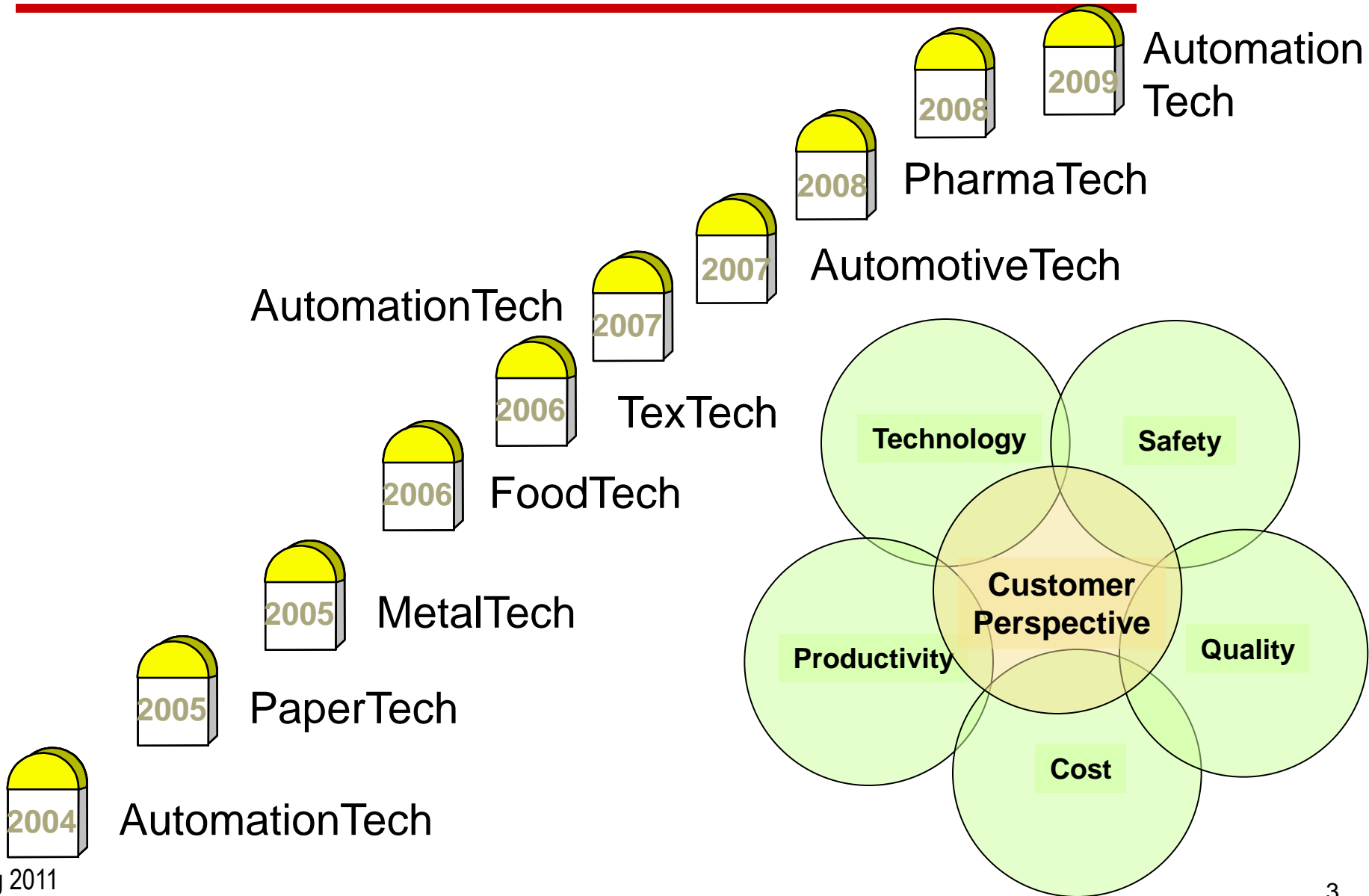
&

President - Automation Industry Association

AIA Objectives ..

- **Increase knowledge and awareness levels about the role of Automation & its value proposition**
- **Help Indian Industry leverage cutting-edge automation technologies and be globally competitive**
- **Enhance Top Management Sensitivity to benefits of Integrated Automation**
- **Build synergy amongst industry, researchers, policy makers and users through seminars and symposia**
- **Support Safety & Compliance standards in Manufacturing**
- **Attract job aspiring community to careers in Automation**

Creating Automation Awareness...



Founding Members

ABB



EMERSON
Process Management

Honeywell

invensys.



Rockwell
Automation

SIEMENS

YOKOGAWA

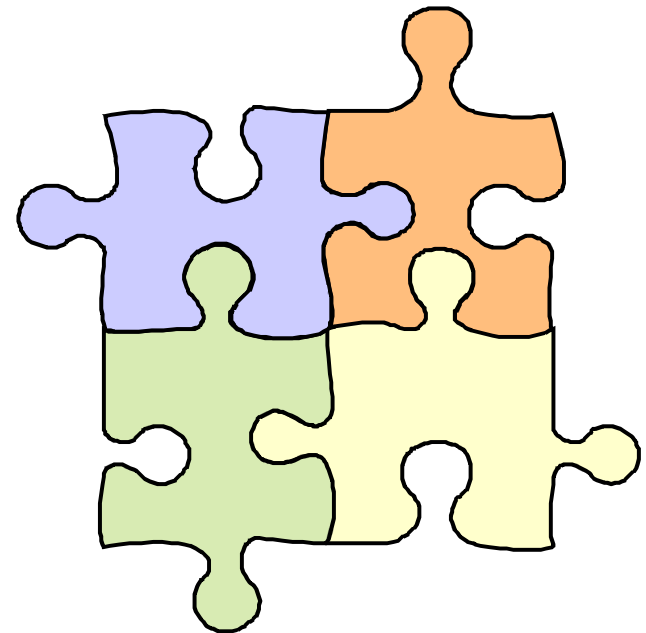


AIA network is here for you

More than 50 partners, getting bigger

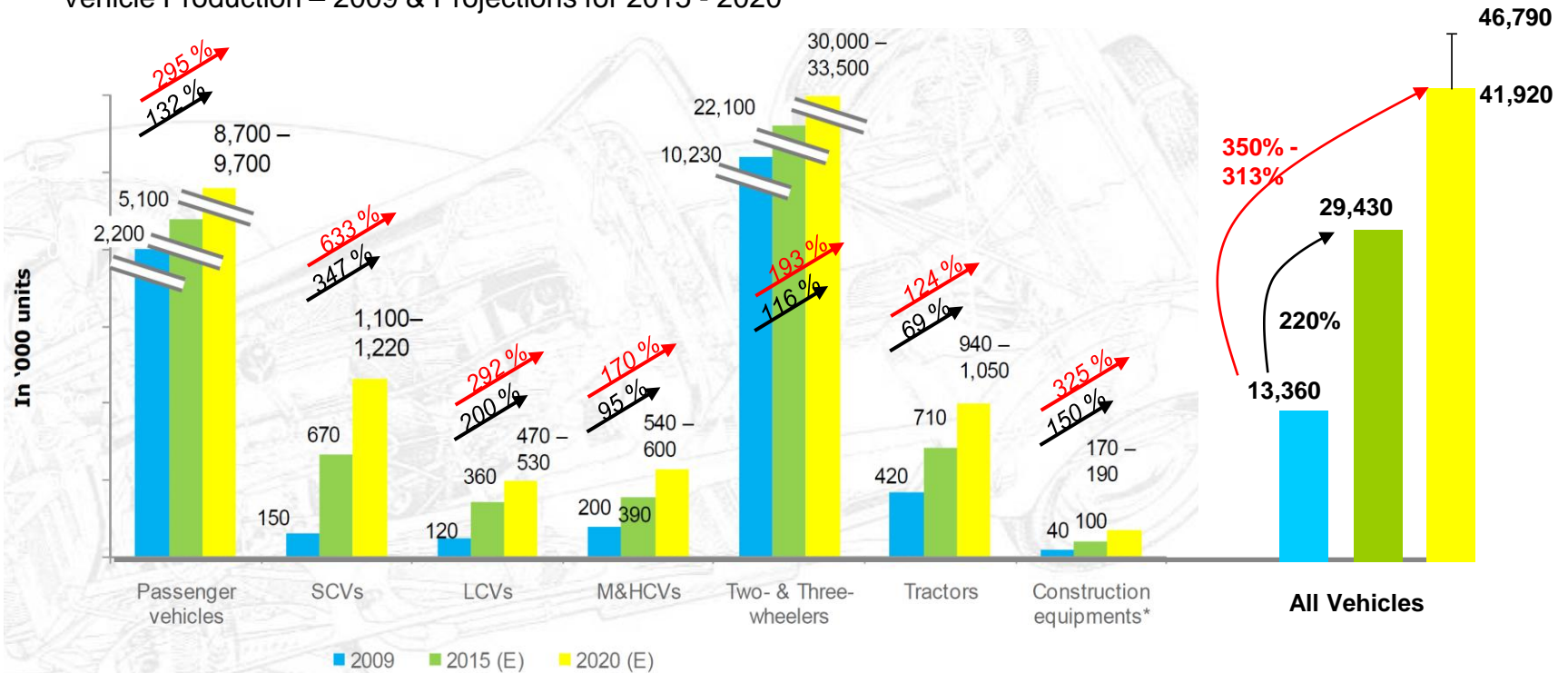
**Automation Community -
building a competitive
economy**

www.aia-india.org



Automotive Industry in India

Vehicle Production – 2009 & Projections for 2015 - 2020



*Includes backhoes, track excavators, wheeled loading shovels, vibratory rollers and liftall

Source: SIAM – EY study

Market Drivers :

- 610 million Indians are less than 25 years old. These potential future car buyers are 2x the size of entire U.S. vehicle population (130 million people will get added to working population by 2013)
- Robust GDP Growth
- Increase in disposable Incomes
- Low Vehicles Penetration is 13 per 1000 people
- Increased investment in Road Infrastructure (NHDP)

Key Trends in the automotive sector - India

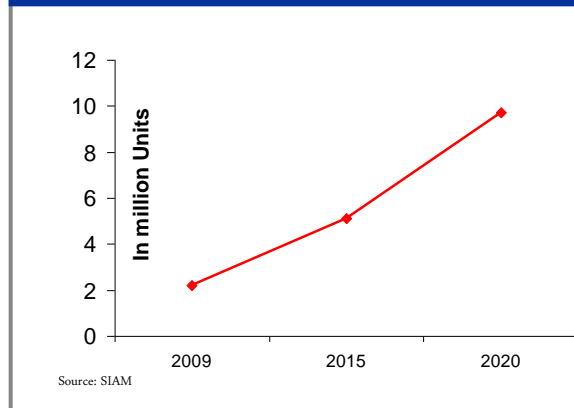
Market Drivers

- Automotive Mission Plan 2016
- 610 million Indians are less than 25 years old. These potential future car buyers are 2x the size of entire U.S. population

Increased investment in Road Infrastructure (NHDP)

- Vehicles Penetration is 13 per 1000 people
- Rising Rural Market

Increase in Car Sales



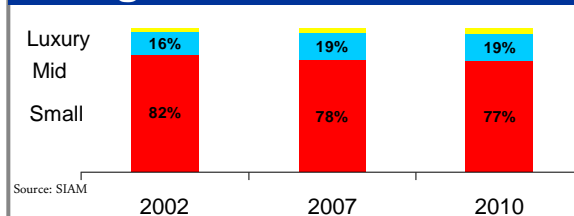
Implications

- Auto Majors are Building Capacity to capture upcoming growth
- Global Auto Majors are entering India to Build Presence & Teams

Market Drivers

- Increased no. of players
- Customers profiles are changing – leading to requirement of innovative features
- Increase in disposable income
- Car Buyers are getting Younger
- Base Customers looking for Smart cars at a lower Price Point.

Segment wise Car Sales



Focus :
Big & Powerful



Focus :
Small & Smart

Implications

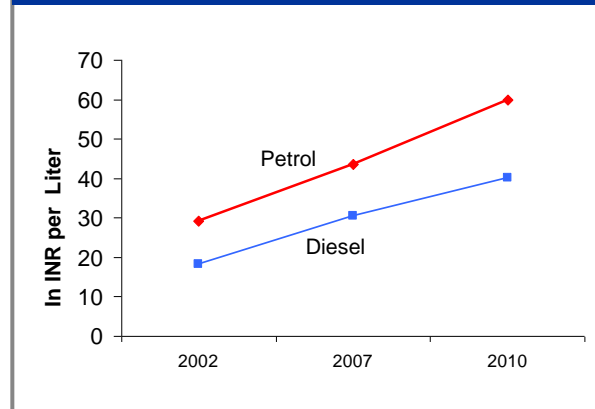
- Multiple Increase in no. of models
- Manage customization in High Volumes
- Improved Supply chain efficiency to sustain high volumes driven by small cars.
- Innovative features for the young buyers.

Key Trends in the automotive sector - India

Market Drivers

- Rise in fuel Prices
- Diesel cars offer higher mileage than Petrol Cars
- Diesel Car acceptability has increased
- Diesel is the only viable alternate fuel car available in India

Increase in Diesel Cars



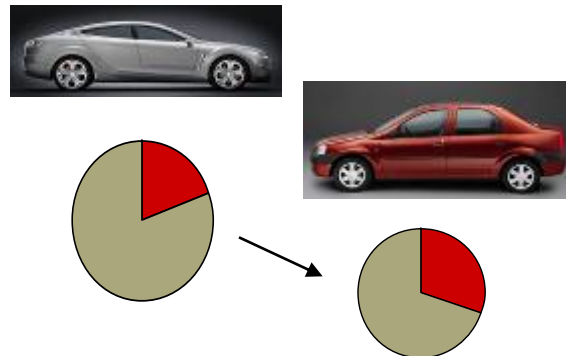
Implications

- Diesel Engine Capacity Buildup
- Auto Majors are working on Alternate Fuel Cars

Market Drivers

- Increased Competition leading to Cost pressure.
- All Auto Majors are developing Small Cars for capturing the fast growing Base market in India.
- Manufacturing efficiency in Indian Auto Industry is 82% ~ 96%. Global Auto Majors efficiency is at 94% ~ 98%

Reduction in Cost per Unit



Implications

- Visibility of Shop floor Manufacturing & Improve manufacturing efficiency.
- Frugal Manufacturing Engineering
- Energy Efficiency
- Improve Supply Chains
- Increased outsourcing to Tier-1 suppliers.

Automotive Manufacturing Targets

Market

- Strong Long Term Growth Fundamentals
- Customers looking for Fair Quality - Smart cars at a lower Price Point
- Multiple Customer Profiles - Rapidly changing
- High Fuel Efficiency demand - mindset
- Customers demand short delivery times

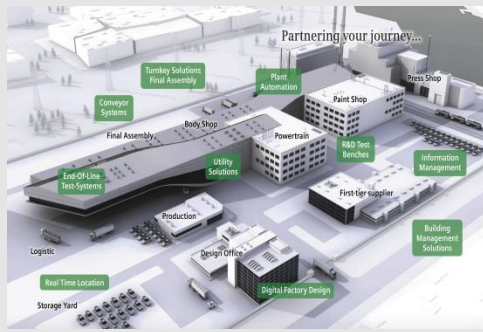


Trends

- Build Manufacturing Capacity & Sales Presence
- Smart Cars with Innovative Features
- Higher No. of Models
- Customization – Colours / Effects
- Energy Efficient



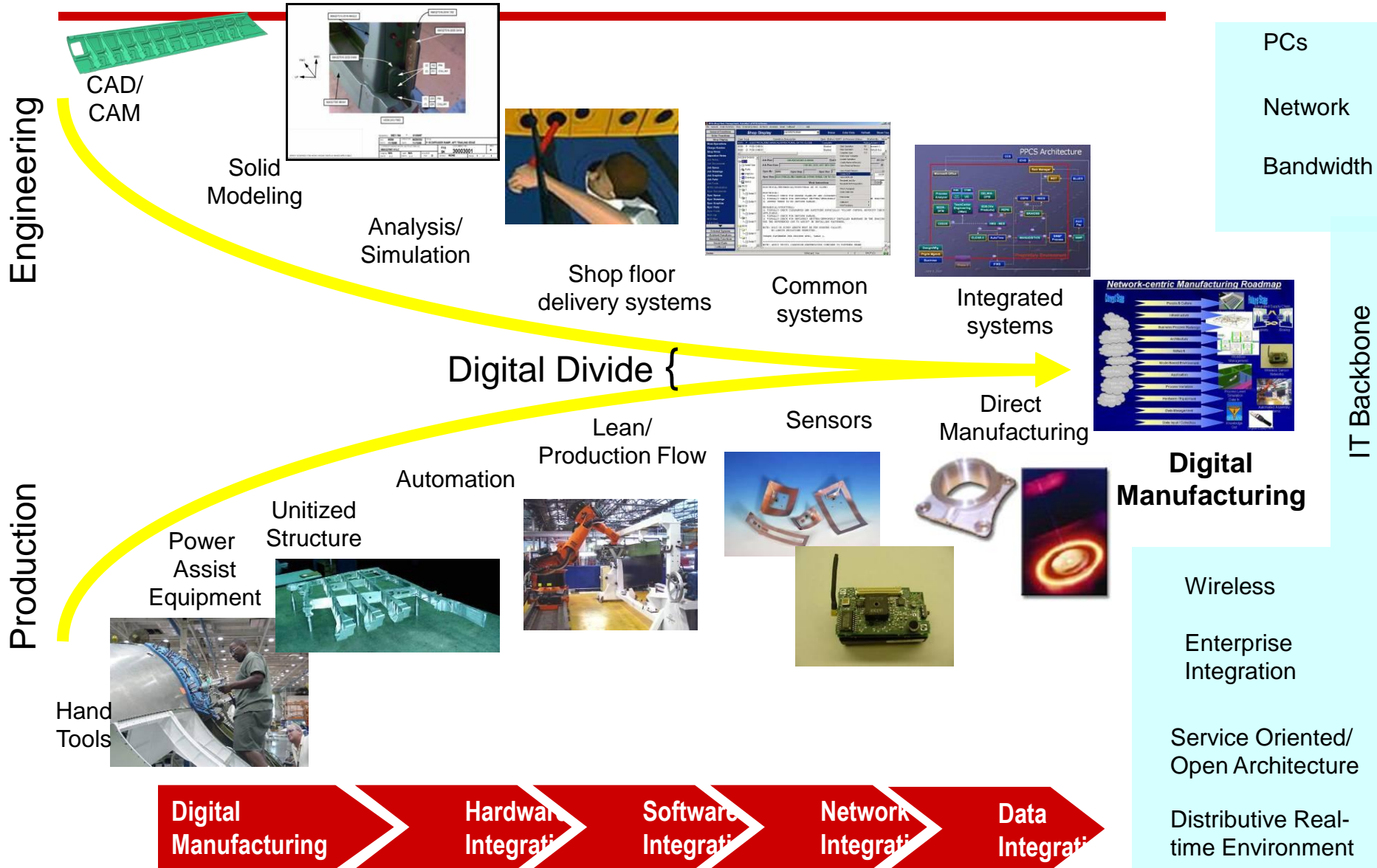
Manufacturing



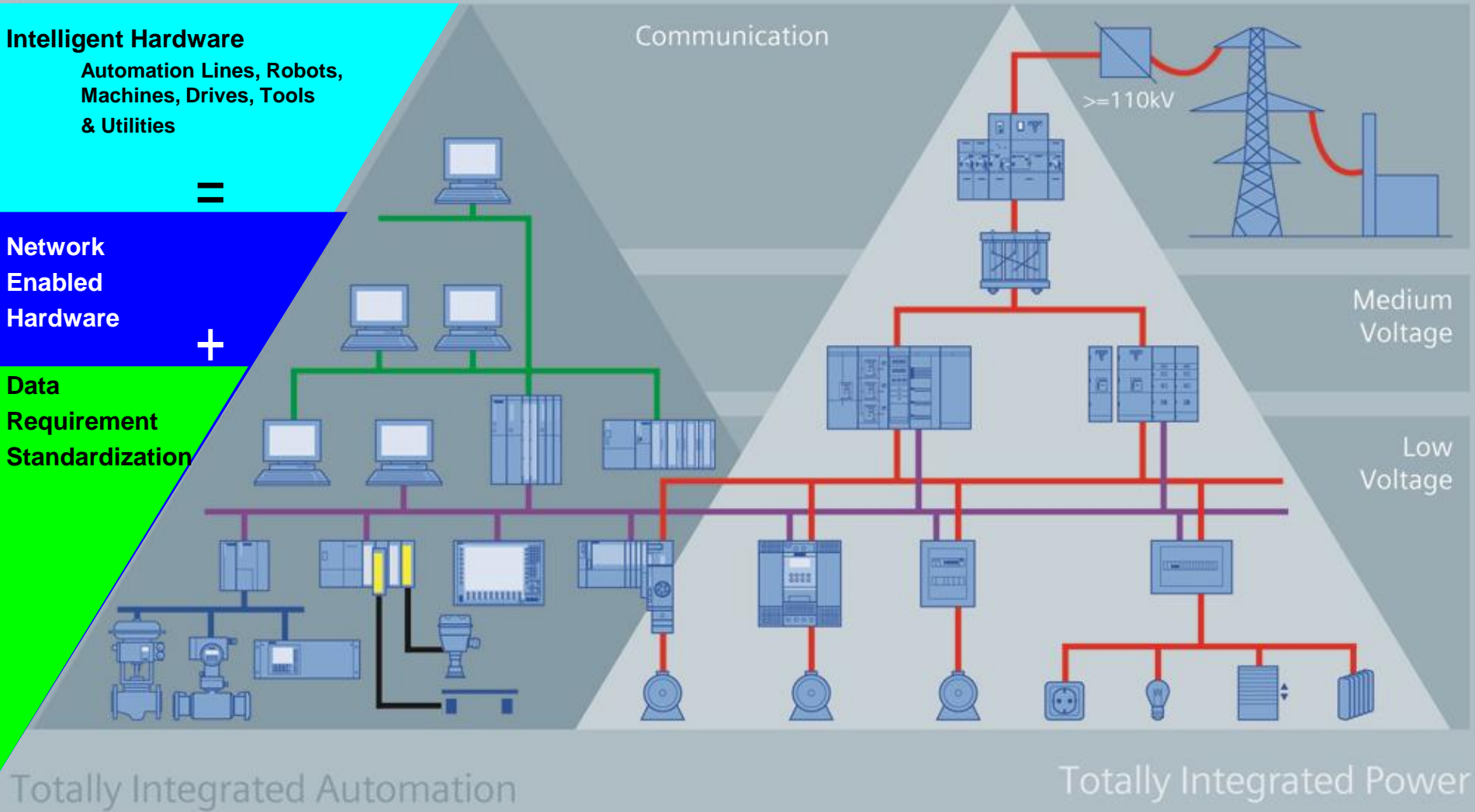
Targets

- Build Manufacturing Capacity – Flexible for multiple models
- Consistent Quality – Shorter First Run up of Plant
- Frugal Manufacturing Engineering
- Manage Customization in High Volume Models
- Improve Supply Chain Efficiency – Global Supply chain
- Visibility of Shop floor Manufacturing – Improve manufacturing Efficiency
- Energy Efficiency in Processes
- Green Manufacturing Concepts – Environment Compatibility

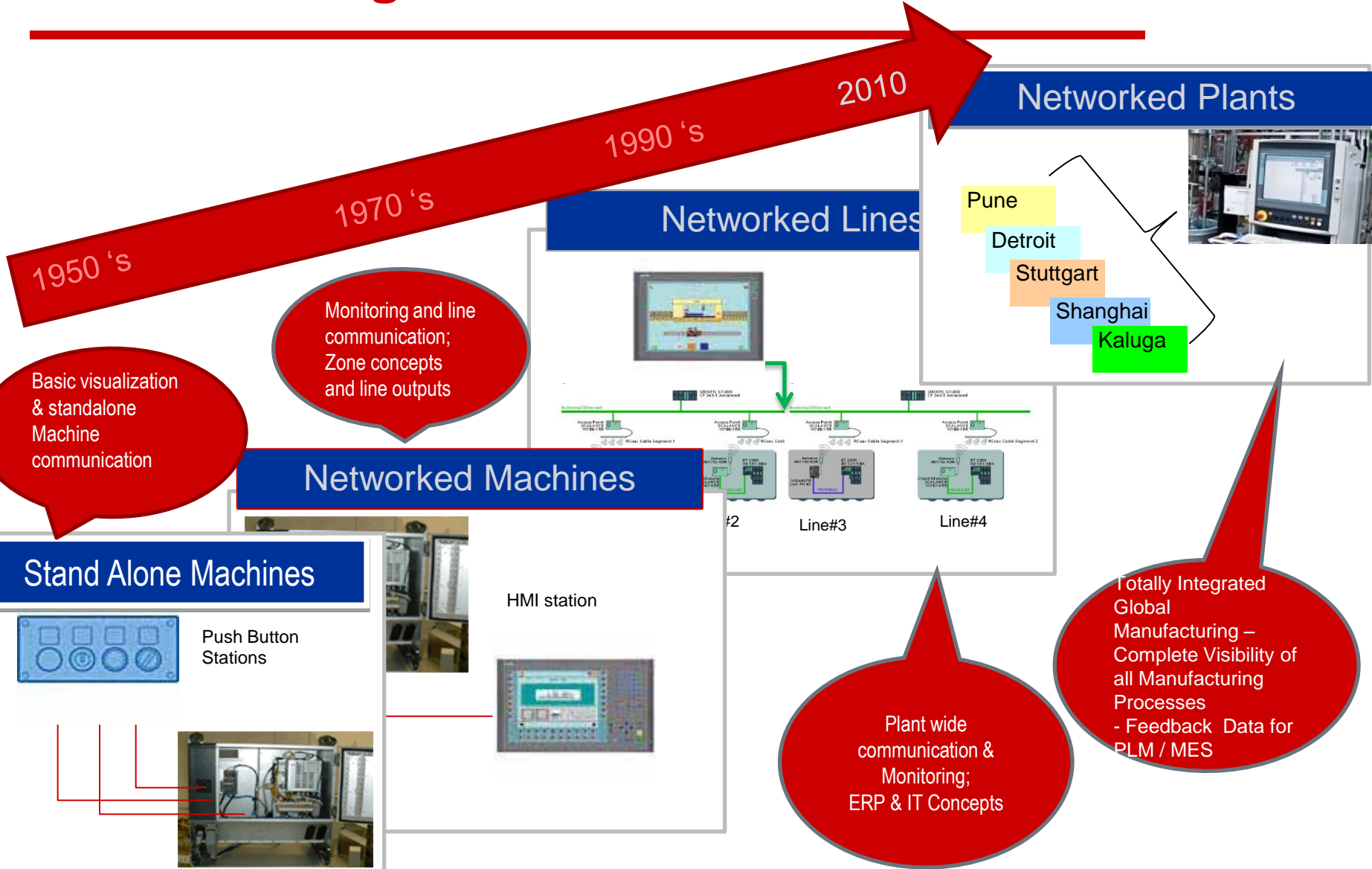
Digital Manufacturing - Vision



Hardware Integration



Network Integration



1950 's

1970 's

1990 's

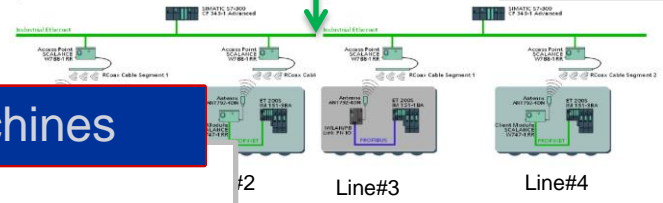
2010

Networked Plants



- Pune
- Detroit
- Stuttgart
- Shanghai
- Kaluga

Networked Lines



Monitoring and line communication;
Zone concepts and line outputs

Networked Machines

Basic visualization & standalone Machine communication

Stand Alone Machines



Push Button Stations



HMI station

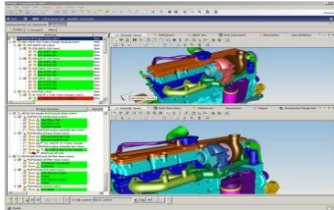


Plant wide communication & Monitoring;
ERP & IT Concepts

Totally Integrated Global Manufacturing – Complete Visibility of all Manufacturing Processes
- Feedback Data for PLM / MES

Software Integration

Product Design



- Body design
- Assembly configuration
- Packaging
- Powertrain design
- Supplier collaboration
- BOM management

Production Planning



- Production Cell Design
- Assembly sequence
- NC Programming
- Offline Robot programming
- Process Simulation
- Building layout

Plant Automation



- SW engineering
- HW engineering
- Construction
- Installation
- Commissioning

Production Execution



- Detailed Order Scheduling
- Resource management
- Track & trace
- Production monitoring
- Performance analysis
- Warehouse mgmt.
- Quality management

Faster Time-to-Production:

Faster vehicle/ variant design process & early data availability for production planning

Faster design /engineering of plant automation:

Integration of automation in digital environment
- "virtual commissioning"

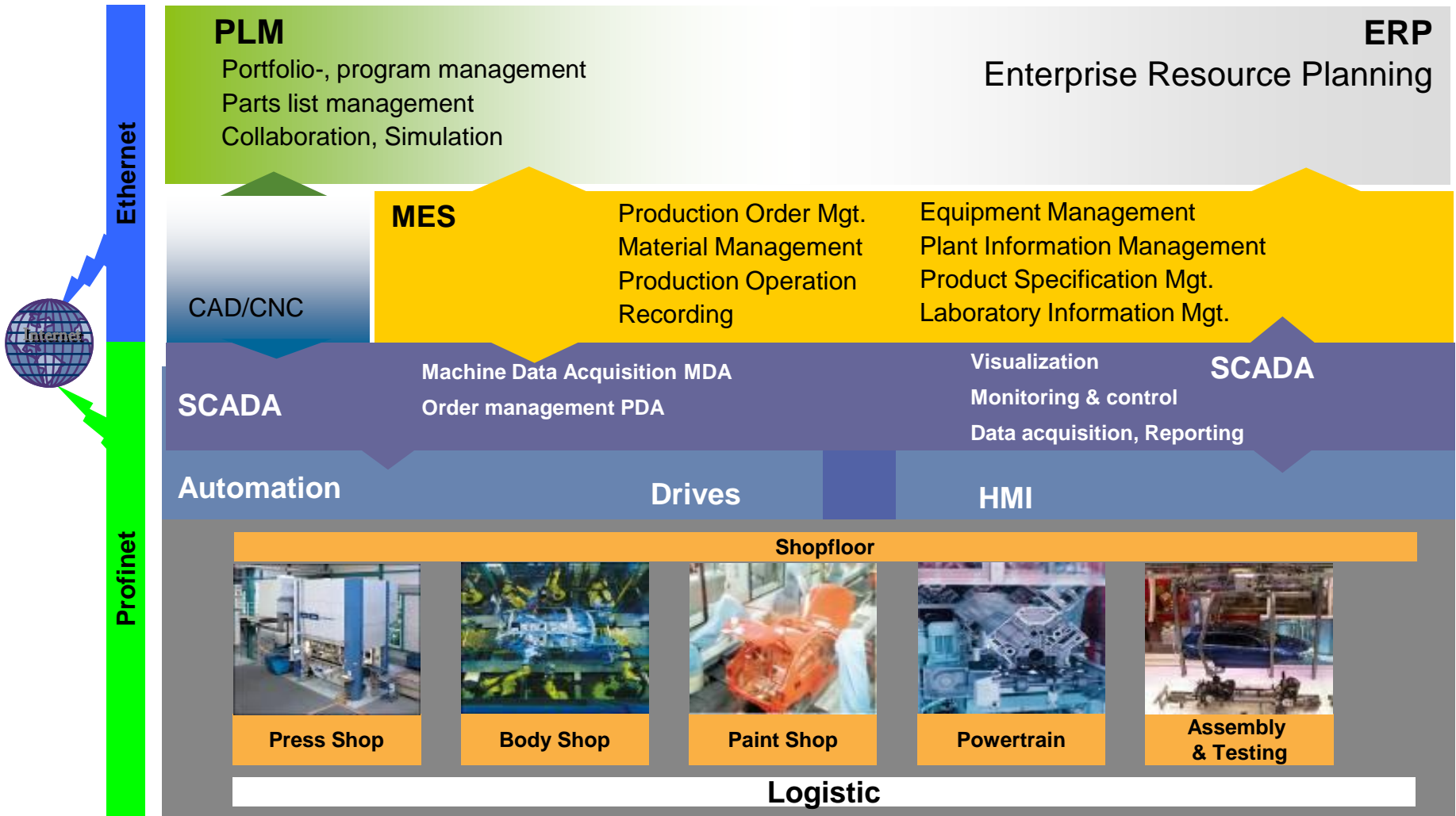
Efficient Production Execution:

Integrated production data management from ERP to Shop-Floor

Efficient Management of changes in product design and production:

Closed-feedback-loop for product design and production execution
Data consistency throughout the entire product life cycle

Data Integration



Thank You

